REMARKS

Claims 16-20 and 38-41 are pending in the present application. By this Response, claim 18 is amended to place it in independent form. Claims 16 and 38 are amended to correct typographical errors. Claims 39-41, which correspond to claims 17, 19 and 20 but are dependent from claim 18, are added. No new matter has been added by the amendments or additional claims. Reconsideration of the claims is respectfully requested.

Amendments are made to the specification to write out the term "ND" as requested by the Examiner in the Office Action and to remove the reference numeral "400" from the description of Figure 4. No new matter has been added by any of the amendments to the specification.

Also, applicants have submitted proposed corrections as suggested by the Examiner in red ink. These changes will be incorporated into a formal set of drawings upon approval of the proposed changes by the Examiner.

I. Allowable Subject Matter

Applicants thank Examiner Cardone for the indication of allowable subject matter in claim 18. By this Response, claim 18 is amended to be in independent form by incorporating the subject matter of independent claim 16 from which it depended. In addition, claims 39-41 are added as dependent claims that are dependent from allowable claim 18. Accordingly, it is Applicants' understanding that claims 18 and 39-41 now stand in condition for allowance.

II. Objections to Figures and Specification

The Office Action objects to the figures as including reference numerals that are not described in the specification and not having some reference numerals that are referred to in the specification. Specifically, Figure 4 is objected to as not having the reference numeral "400," Figure 5 is objected to for not including reference numerals

"648" and "640," Figure 5 is further objected to for including reference numeral "541" which is not described in the specification, and Figure 2 is objected to for allegedly having the typographical error "sever."

By this Response, a replacement sheet for Figure 5 is provided that amends the figure to remove the reference numeral "541" and to change one of the reference numerals "548" to be "546" in correspondence with the specification. The specification does not make reference to numerals "648" and "640" when describing Figure 5 and thus, there is no need to include these reference numerals in Figure 5. To the contrary, elements 648 and 640 appear in Figure 6.

With regard to Figure 4, the reference to numeral "400" in the specification has been removed by the amendments to the specification above and thus, there is no need to include reference numeral 400 in Figure 4. Regarding claim 2, formal drawings were submitted on December 14, 2001 in which the term "sever" was corrected.

In view of the above amendments to Figure 5 and the specification, Applicants respectfully request withdrawal of the objection to the drawings and the specification.

III. Alleged Double Patenting

The Office Action rejects claims 16, 17, 19 and 38 as being allegedly anticipated by claims 8-31 of U.S. Patent No. 5,371,852 and thus, constituting double patenting. Applicants respectfully submit that claims 16, 17, 19 and 38 are not double patenting in view of claims 8-31 of Attanasio et al, U.S. Patent No. 5,371,852 (hereafter referred to as "Attanasio").

Claims 16, 17, 19 and 38 all recite a dispatch layer that is between a TCP layer and an IP layer. None of the claims 8-31 of Attanasio teach or suggest a dispatch layer between a TCP layer and an IP layer. While the claims mention IP message headers, routing of messages, TCP port numbers, and TCP messages, there is no teaching or suggestion in any of claims 8-31 of Attanasio regarding a dispatch layer between an IP layer and a TCP layer. Furthermore, the Office Action fails to indicate where such a feature is taught or suggested in any of the claims 8-31. Moreover, the Office Action

fails to provide any teaching, suggestion or motivation to modify the invention recited in claims 8-31 of Attanasio to include a dispatch layer between a TCP layer and an IP layer.

Furthermore claims 16, 17 and 19 all recite that the dispatch layer has a plurality of modes of operating including a first mode of operation in which the dispatch layer receives a packet from a client, wherein the packet includes the destination address; a second mode of operation, responsive to receiving the packet, in which the dispatch layer identifies a process within the plurality of processes to service the client, wherein the process is an identified process; a third mode of operation in which the dispatch layer translates the destination address to a process address for the identified process within the plurality of processes; and a fourth mode of operation, responsive to the third mode of operation, in which the packet is sent to the packet routing layer. Claims 8-31 of Attanasio do not teach or suggest any dispatch layer, let alone a dispatch layer between a TCP layer and an IP layer, that has these four modes of operation. Again, the Office Action fails to show where any of these features are taught or suggested in any of claims 8-31 of Attanasio and fails to provide any suggestion or motivation for including such features in the invention recited in claims 8-31 of Attanasio.

Claim 38 further recites that the dispatch layer, that is between a TCP layer and an IP layer, translates a destination address to an intermediate destination address which is an address for a selected process within a plurality of processes. None of the claims 8-31 teach or suggest a dispatch layer that is between a TCP layer and an IP layer that also translates destination addresses into intermediate destination addresses for a selected processes within a plurality of processes. Again, the Office Action fails to identify so much as a single claim where such features are taught or suggested. Rather, the Office Action merely makes an allegation that the features of the claims are taught in claims 8-31, i.e. 23 claims. The Office Action fails to point to any teaching in any of the claims with particularity as teaching these features or even suggesting these features and thus, has failed to establish a case of double patenting with regard to claim 38.

In view of the above, Applicants respectfully submit that claims 16, 17, 19 and 38 are not double patenting in view of claims 8-31 of Attanasio and the rejection should be withdrawn. Accordingly, Applicants respectfully request withdrawal of the rejection of

claims 16, 17, 19 and 38 under alleged double patenting based on claims 8-31 of Attanasio.

IV. 35 U.S.C. § 102, Alleged Anticipation

The Office Action rejects claims 16, 17, 19 and 38 under 35 U.S.C. § 102(e) as being anticipated by Brendel et al. (U.S. Patent No. 5,774,660). This rejection is respectfully traversed.

As to independent claims 16 and 38, the Office Action states:

> 10. Regarding claims 16 and 38, Brendel discloses a computer comprising:
>
> a plurality of processes, wherein the plurality of processes service a destination address and have process addresses [Brendel, col. 13, lines 18-46];
>
> a packet routing layer, wherein the packet routing layer routes a packets to the plurality to the plurality of processes using a destination addresses within the packets [ie. TCP layer, Brendel, col. 13, lines 18-46];
>
> a dispatch layer between a TCP layer and an IP layer, wherein the dispatch layer has a plurality of modes of operation including: a first mode of operation in which the dispatch layer receives a packet from a client, wherein the packet includes the destination address [ie. raw socket, Brendel, col. 14, line 56 – col. 15, line 56];
>
> a second mode of operation, responsive to receiving the packet, in which the dispatch layer identifies a process within the plurality of processes to service the client, wherein the process is an identified process [Brendel, col. 14, line 41-col. 15, line 16];
>
> a third mode of operation in which the dispatch layer translates the destination address to a process address for the identified process within the plurality of processes;
>
> and a fourth mode of operation, responsive to the third mode of operation, in which the packet is sent to the packet routing layer [Brendel, col. 17, lines 9-26].

Office Action dated April 28, 2004, pages 4-5.

Claim 16 recites:

16. A computer comprising:

a plurality of processes, wherein the plurality of processes service a destination address and have process addresses;

a packet routing layer, wherein the packet routing layer routes packets to the plurality of processes using a destination addresses within the packets;

a dispatch layer between a TCP layer and an IP layer, wherein the dispatch layer has a plurality of modes of operation including:

a first mode of operation in which the dispatch layer receives a packet from a client, wherein the packet includes the destination address;

a second mode of operation, responsive to receiving the packet, in which the dispatch layer identifies a process within the plurality of processes to service the client, wherein the process is an identified process;

a third mode of operation in which the dispatch layer translates the destination address to a process address for the identified process within the plurality of processes; and

a fourth mode of operation, responsive to the third mode of operation, in which the packet is sent to the packet routing layer.

A prior art reference anticipates the claimed invention under 35 U.S.C. § 102 only if every element of a claimed invention is identically shown in that single reference, arranged as they are in the claims. *In re Bond*, 910 F.2d 831, 832, 15 U.S.P.Q.2d 1566, 1567 (Fed. Cir. 1990). All limitations of the claimed invention must be considered when determining patentability. *In re Lowry*, 32 F.3d 1579, 1582, 32 U.S.P.Q.2d 1031, 1034 (Fed. Cir. 1994). Anticipation focuses on whether a claim reads on the product or process a prior art reference discloses, not on what the reference broadly teaches. *Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 218 U.S.P.Q. 781 (Fed. Cir. 1983). Applicants respectfully submit that Brendel does not identically show every element of the claimed invention arranged as they are in the claims. Specifically, Brendel does not teach a dispatch layer between a TCP layer and an IP layer or such a dispatch layer that has the four modes of operation recited in claim 16.

Brendel is directed to a system for resource-based load balancing on a distributed resource multi-node network. With the system of Brendel, a load balancer receives all requests from clients using virtual address for a web site. The load balancer makes a connection with the client and waits for a URL of the resource requested by the client. The load balancer waits to perform load balancing until after the location of the requested

resource is known. The connection and URL request are passed from the load balancer to a second node having the requested resource. The load balancer re-plays the initial connection packet sequence to the second node but modifies the address to that of the second node. The network software is modified to generate the physical network address of the second node but then changes the destination address back to the virtual address. Since all requests are first received by the load balancer which determines the physical location of the requested resource, nodes may contain different resources. The entire contents of the web site are not mirrored onto all nodes. Network bottlenecks are avoided since the nodes transmit files back to the client directly, bypassing the load balancer.

Thus, Brendel teaches a load balancing mechanism in which a load balancer identifies the location of a requested resource and then modifies the virtual address received from the client to an address for the node having the requested resource. The node may then use the virtual address to directly communicate the requested resource to the client without having to go through the load balancer. Brendel does not teach a dispatch layer that is between a TCP layer and an IP layer. Furthermore, Brendel does not teach a dispatch layer that is between a TCP layer and an IP layer and that has the four modes of operation recited in claim 16 of the present application.

The Office Action alleges that Brendel teaches a dispatch layer that is between a TCP layer and an IP layer at column 14, line 56 to column 15, line 56 which reads as follows:

> Local packets that are not of a known protocol such as TCP or UDP (User Datagram Protocol) have an unrecognized protocol. These datagrams are sent to raw socket 214, bypassing TCP module 218. Any applications in application layer 80 can listen to raw socket 214 and use the datagram, since raw sockets are a standard TCP/IP feature. Load balancer 70 is an application which listens to raw socket 214 for datagrams using the "IXP" protocol. Since the IXP protocol is not a defined protocol, no other applications should be looking for IXP datagrams. Thus using the IXP protocol allows use of raw socket 214 to bypass the TCP layer and send the datagrams directly to load balancer 70. These datagrams are the connection packets and the URL originally from the client's browser.
>
> Each server is modified to accept packets using the virtual IP address by aliasing a second IP address, thus using two IP addresses. For example, in UNIX, the command:

% ifconfig de0 230.101.17.200 alias netmask Oxffffffff

specifies that a second IP address, the virtual IP address 230.101.17.200 is also an IP address for the node. Other operating systems also support IP address aliasing.

Modified IP Input Module--FIG. 15

FIG. 15 is a flowchart for a modified IP layer input module. The server with the load balancer uses modified IP input module 200. An asterisk is used to indicate that the module is modified from the generic ip_ input() module. Steps 308, 310, 312, and 314 are added steps which are not in the generic IP module.

All packets received from the media by the lower link layer are passed up to the IP layer which calls IP input module 200. Step 302 tests to determine if the packet is for the local node by reading the destination IP address.

When step 302 determines that the destination IP address is not a local IP address, then the packet is being routed through the local node and the IP layer acts as a software router. The packet is passed to IP forward module 202 (step 304) which prepares the packet for forwarding. The packet is then sent to IP output module 206 before being re-transmitted out the link layer to the destination or the next hop.

Step 302 determines that the packet is for the local node when the IP address is the virtual IP address or the real IP address for the server. The packet is stripped of its header information and possibly assembled with other packets to form the IP datagram, step 306.

The assembled IP datagram from step 306 is normally sent up to the TCP layer (steps 316, 318) for the generic IP module. The invention performs additional steps before step 306 by modifying the generic IP input module to form modified IP input module 200. Modified IP input module 200 checks the protocol to determine if it is the IXP protocol. Since incoming packets from the Internet always use the TCP protocol, incoming packets fail step 308 and are then tested by step 310 to determine if they are TCP packets with the virtual IP address and are world-wide-web packets. Thus step 310 looks for incoming packets. These incoming packets have their protocols changed from TCP to IXP, step 314. The IXP protocol is not a recognized protocol, so step 316 causes these incoming packets to be sent to the raw socket, step 320, so that the load balancer application can read these packets. Thus changing the protocol to the unrecognized IXP protocol forces the incoming packets to be sent directly to the load balancer. This allows all incoming packets from the Internet to be routed through the load balancer.

Other TCP packets which are not world-wide web packets fail step 310 and are not modified. These ordinary TCP packets are a known protocol, step 316, and are sent to the TCP layer, step 318.

(emphasis added)

The most pertinent part of the above cited portion of Brendel is the description of Figure 15. This description states that the IP layer calls the modified IP module 200. The modified IP module 200 checks to see if a received data packet is in the IXP protocol and if not, converts the data packet from TCP to IXP so that the data packet is directly sent to a raw socket for reading by the load balancer. There is no mention of any dispatch layer between a TCP layer and an IP layer in this, or any other, section of Brendel. While the TCP layer and the IP layer are mentioned, the actual functions of converting protocols from TCP to IXP is performed in the IP layer by calling a modified IP module 200. Furthermore, the functions that are performed by this modified IP module 200 merely converts protocols and does not perform the functions of the dispatch layer as recited in claim 16.

Claim 16 specifically recites that the dispatch layer has four modes of operation. A first mode of operation is one in which the dispatch layer receives a packet from a client, wherein the packet includes the destination address. A second mode of operation is one in which, responsive to receiving the packet, the dispatch layer identifies a process within the plurality of processes to service the client, wherein the process is an identified process. Nowhere in the cited section of Brendel is there any teaching of a dispatch layer, that is between a TCP layer and an IP layer, that performs the function of the second mode set forth in claim 16.

The Office Action alleges that this second mode of operation is taught by Brendel at column 14, line 41 to column 15, line 16 which is part of the reproduced section of Brendel above. However, nowhere in this section is there any teaching regarding a dispatch layer between a TCP layer and an IP layer, identifying a process within a plurality of processes to service a client. In fact, the section cited as allegedly teaching these features is under the heading "Modified IP layer – FIG. 14" (column 14, line 38). Furthermore, the section discusses determining if the packet is destined for a local node or another node and that local packets are assembled into IP datagrams. There is not teaching or even suggestion regarding a dispatch layer between an IP layer and a TCP layer identifying a process within a plurality of processes to service a client.

A third mode of operation of the dispatch layer, as recited in claim 16, is one in which the dispatch layer translates the destination address to a process address for the identified process within the plurality of processes. Again, there is no teaching or suggestion in Brendel with regard to a dispatch layer between a TCP layer and an IP layer performing such a function. The Office Action fails to cite a specific portion of the reference that allegedly teaches this feature. The Office Action does cite column 17, lines 9-26 as allegedly teaching the fourth mode of operation and it may be that the Office Action intends to state that this section also teaches the features of the third mode of operation, it is unclear. However, the cited section does not teach either of the features of the third mode or the fourth mode of operation which is one in which, responsive to the third mode of operation, in which the packet is sent to the packet routing layer.

Column 17, lines 9-26 reads as follows:

> Incoming packets which are assigned to the load balancer node's server are passed up and down the local TCP/IP stack twice. These packets are first sent from the low-level link layer through the modified IP layer to the load balancer in the application layer, and then back down through the IP layer to the link layer. Step 336 of FIG. 16 detects that the local server is the destination and bypasses steps 338, 340 so that the protocol is left as IXP.
>
> The link layer recognizes that the NIC address is the local NIC address and does not transmit the packets. Instead the packets are sent back up to the IP layer. Step 308 of FIG. 15 detects these packets and changes the protocol back to TCP (step 312) and then passes the TCP packets to the HTTPD server application through the generic TCP layer. This sequence only occurs for a packet that has been intercepted to the load balancer and assigned to the server on the local node.

This section of Brendel provides further support for the distinction of the present claims reciting a dispatch layer between an IP layer and a TCP layer, a feature not taught by Brendel. This section of Brendel states that the packet is sent from the link layer to the modified IP layer and then to the application layer bypassing the TCP layer. Thus, Brendel teaches a mechanism in which the IP layer is modified to bypass the TCP layer and send data packets directly to the load balancer in the application layer. Brendel does not teach or suggest a dispatch layer between a TCP layer and an IP layer.

Brendel further does not teach a dispatch layer that performs the functions of operational modes three and four in claim 16. That is, there is not teaching in the above cited section regarding a dispatch layer between a TCP layer and an IP layer that translates a destination address to a process address for an identified process within a plurality of processes or that, responsive to this translation, sends the packet to a packet routing layer. While Brendel may teach modifying protocols from TCP to IXP and back again, there is nothing in Brendel that teaches a dispatch layer between a TCP layer and an IP layer that identifies a process from a plurality of processes to service a client, translates a destination address to a process address for the identified process, and then sends the data packet to a packet routing layer.

Independent claim 38 recites some similar features to that of claim 16. Specifically, claim 38 recites instructions for translating, in a dispatch layer between a TCP layer and an IP layer, a destination address to an intermediate destination address which is an address for a selected process within a plurality of processes. Similar features to these have been addressed above with regard to claim 16 and thus, claim 38 is distinguished over the Brendel reference for similar reasons. Brendel does not teach or suggest these features in claim 38.

In view of the above, Applicants respectfully submit that Brendel does not teach each and every feature of independent claims 16 and 38. At least by virtue of their dependency on claim 16, Brendel does not teach each and every feature of dependent claims 17 and 19. Accordingly, Applicants respectfully request withdrawal of the rejection of claims 16, 17, 19 and 38 under 35 U.S.C. § 102(e).

V. 35 U.S.C. § 103, Alleged Obviousness

The examiner has rejected claim 20 under 35 U.S.C. § 103(a) as being unpatentable over Brendel in view of Coile et al. (U.S. Patent No. 6,061,349). This rejection is respectfully traversed for at least the same reasons as set forth above with regard to independent claim 16 from which claim 20 depends. That is, Brendel does not teach a dispatch layer between a TCP layer and an IP layer or such a dispatch layer that

has the four modes of operation recited in claim 16. Coile, likewise, does not teach or suggest these features.

Coile is cited merely as teaching server daemon processes. Coile does not provide for the deficiencies of Brendel and thus, any alleged combination of Brendel and Coile, even if such a combination were possible and one of ordinary skill in the art were somehow motivated to attempt such a combination, would not result in the invention as recited in independent claim 16, from which claim 20 depends.

Therefore, Applicants respectfully submit that neither Brendel nor Coile, either alone or in combination, teach or suggest all of the features of claim 20. Accordingly, Applicants respectfully request withdrawal of the rejection of claim 20 under 35 U.S.C. § 103(a).

VI. Conclusion

It is respectfully urged that the subject application is patentable over Brendel and Coile and is now in condition for allowance. The Examiner is invited to call the undersigned at the below-listed telephone number if in the opinion of the Examiner such a telephone conference would expedite or aid the prosecution and examination of this application.

Respectfully submitted,

DATE: July 28, 2004

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Attachment:

Replacement sheet for Figure 5

FIG. 5

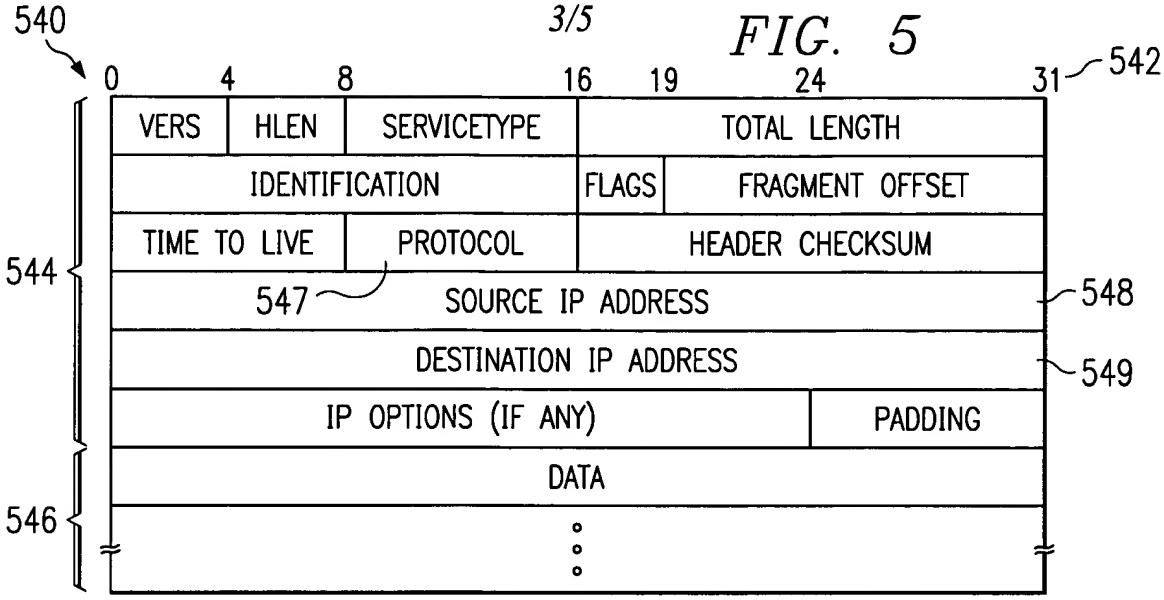

FIG. 6

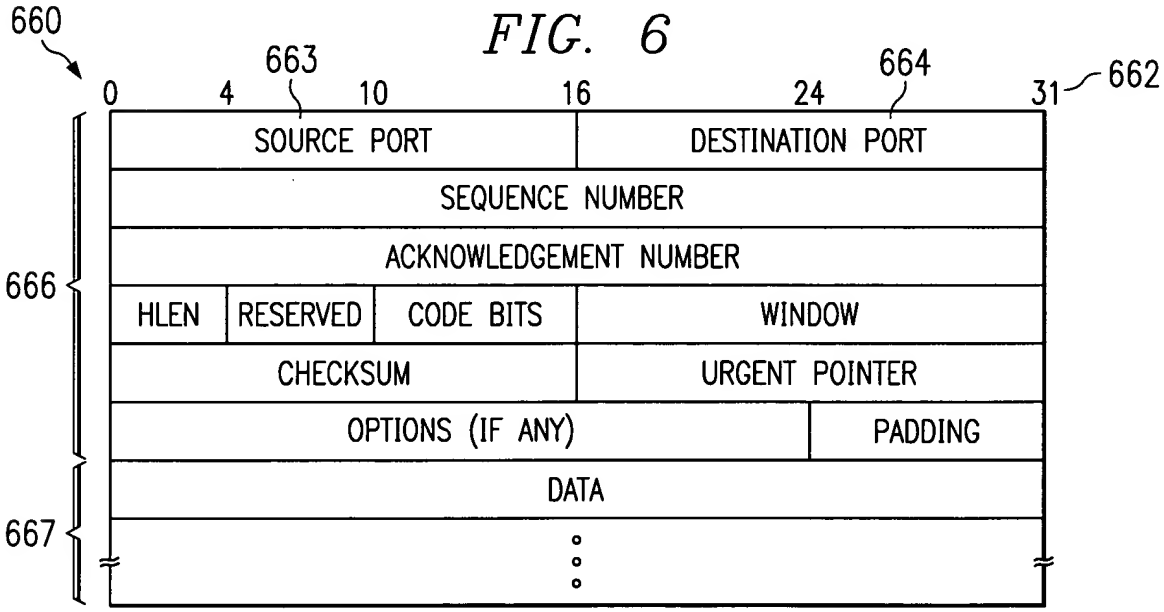

FIG. 7